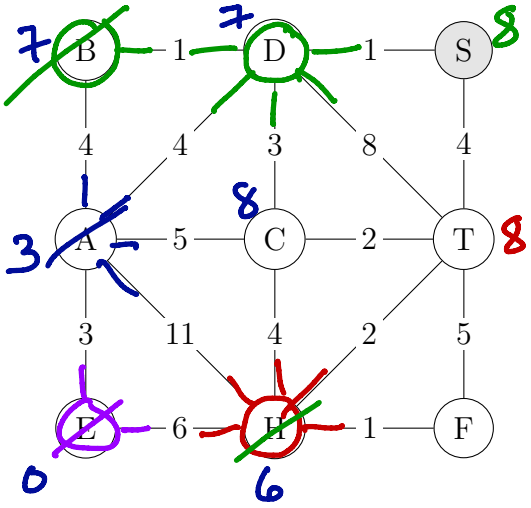
Worksheet 11 (Graph Theory 3): Dijkstra's Algorithm

1. Use Dijkstra's Algorithm to determine the shortest (weighted) distance between vertex S and vertex E.

   Keep track of the steps of the algorithm in the table to the right of the graph, and then fill in the final shortest distances between S and each other vertex below.



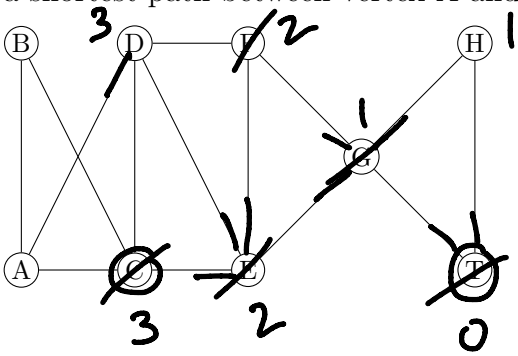
vertex	current/ visited	**tentative** minimum distance to e	preceding vertex
A	✓	3	E
B	✓	7	A
C	✓	8	A
D	✓	7	A
E	✓	0	—
F	✓	7	11
H	✓	6	E
T		8	H
S	C stop	8	D

Length of the shortest path from S to E: 8

Find the shortest path from S to E *using the last column in the table.*

S D A E

2. We can also use Dijkstra's algorithm to find the shortest distance between two vertices in a graph that does not have weights on the edges, by assuming all of the weights are 1. Find a shortest path between vertex A and vertex T. As usual, break ties alphabetically.



vertex	current/ visited	**tentative** minimum distance to e	preceding vertex
A	C stop	4	C
B		4	C
C	C V	3	E
D	C V	3	E
E	C V	2	G
F	C V	2	G
G	C V	1	T
H	C V	1	T
T	C V	0	—

Length of the shortest path from A to T: 4

Find the shortest path from A to T *using the last column in the table.*

A C E G T